FlyBy Math™ Alignment
Academic Standards: Mathematics

Number and Operation

Content Standard 1.0 The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically, and graphically and to compute fluently and make reasonable estimates in problem solving.

Learning Expectations and Accomplishments	***FlyBy Math*™ Activities**
7.1.1 Understand numbers, ways of representing numbers, relationships among numbers, and number systems. j. understand and use ratios and proportions to represent quantitative relationships;	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios. --Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.
7.1.3 Solve problems, compute fluently, and make reasonable estimates. e. solve two-step real-world problems involving whole numbers, fractions, decimals, and percents; f. develop methods for solving problems involving proportions (e.g., scaling, finding equivalent ratios)	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios. --Predict outcomes and explain results of mathematical models and experiments. --Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.

Algebra

Content Standard 2.0 The student will understand and generalize patterns as they represent and analyze quantitative relationships and change in a variety of contexts and problems using graphs, tables, and equations.

Learning Expectations and Accomplishments	***FlyBy Math*™ Activities**
7.2.1 Understand patterns, relations, and functions. c. use tables, graphs, and symbolic rules to generalize patterns in data.	--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.
7.2.2 Represent and analyze mathematical situations and structures using algebraic symbols. b.represent mathematical statements and real-world situations using symbols; i. explore relationships between symbolic expressions and graphs of lines.	--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system. --Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system. --Use tables, graphs, and equations to solve aircraft conflict problems. --Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.
7.2.4 Analyze change in various contexts.	--Interpret the slope of a line in the context of a distance-rate-time problem.

a. describe how changes in one quantity or variable result in changes in another. b. use unit rates to solve problems (e.g., miles per hour, words per minute)	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.

Geometry

Content Standard 3.0 The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one-, two-, and three-dimensional figures.

Learning Expectations and Accomplishments	***FlyBy Math™* Activities**
7.3.2 Specify locations and describe spatial relationships using coordinate geometry and other representational systems. a. plot a given set of points on the coordinate plane.	--Plot points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system to describe the motion of two airplanes.
7.3.4 Use visualization, spatial reasoning, and geometric modeling to solve problems. c. use visualization and spatial reasoning to solve real-world problems.	--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation. --Predict the relative motion of two airplanes on given paths. --Apply mathematics to predict and analyze aircraft conflicts and validate through experimentation.

Measurement

Content Standard 4.0 The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-world problems.

Learning Expectations and Accomplishments	***FlyBy Math™* Activities**
7.4.2 Apply appropriate techniques, tools, and formulas to determine measurements. b. select and apply techniques and tools to accurately measure length, perimeter, area, volume, and angles to appropriate levels of precision; f. construct tables and graphs to represent rates of change.	--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation. --Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.

Data Analysis & Probability	
Content Standard 5.0 The student will understand and apply basic statistical and probability concepts in order to organize and analyze data and to make predictions and conjectures.	
Learning Expectations and Accomplishments	***FlyBy Math™* Activities**
7.5.1 Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer questions. a. formulate questions, design studies, and collect real-world data; b. construct, interpret, and use multiple-bar graphs, multiple-line graphs, and circle graphs displaying real-world data.	--Conduct simulation and measurement for several aircraft conflict problems. --Represent distance, rate, and time data using tables, line plots, bar graphs, and line graphs. --Choose among tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.
7.5.3 Develop and evaluate inferences and predictions that are based on data. a. make conjectures and predictions based on data;	--Predict outcomes and explain results of mathematical models and experiments. --Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.